PAIN MANAGEMENT AFTER TOTAL KNEE ARTHROPLASTY: A CASE-CONTROL STUDY OF CONTINUOUS FEMORAL NERVE BLOCK THERAPY

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Introduction: Maximizing pain management is paramount to obtaining the best patient outcomes, decreasing complications and length of stay, and reducing hospital costs. Continuous femoral nerve block catheter infusions (CFNBI) have been found to both decrease patient postoperative pain and improve postoperative joint mobilization which impact patient satisfaction, outcome, and length of stay.

Identification of the problem: We began use of CFNBIs in 2008. We created a policy, process, standing order form, and staff education plan to maximize therapy efficacy. We developed a research project format to evaluate the patient response to post op pain and mobilization to determine if the continuous nerve block procedure was beneficial.

Purpose of the study: We had three specific research questions:
-Will case group patients (CFNBI therapy) report less pain than the control group patients (those not receiving CFNBI therapy)?
-Will case group patients require less narcotic analgesic medication post op than control group patients?
-Will case group patients achieve mobilization goals earlier than control group patients?
It was expected that the CFNBI group would have less pain, require less medication and achieve earlier mobilization.

Methods: Retrospective chart review of all patients undergoing Total Knee Arthroplasty (TKA) from August 2008-July 2009. Exclusion criteria included: Previous open surgical intervention on the affected joint; inability to rate pain using the Visual Analog Scale (VAS); failed placement of the continuous nerve block catheter; administration of spinal or epidural anesthesia; and/or documented neuropathic pain or sensory disorders in the operative limb. Using a matching case-control research design patients from the case and control groups were matched by BMI, ASA, and age. 27 pairs met our matching criteria. Variables analyzed included average daily patient reported pain level using the 0-10 VAS, daily amount and type of narcotic analgesic used and achievement of personalized Physical Therapy goal. Seven additional data collection fields may be used in future studies. Variable analysis included measure of central tendency and measure of variation. A Student' t-test was utilized for data analysis of paired data.

Results: The CFNBI case group reported significantly less pain over the first three postoperative days (p= 0.010), but findings revealed no significant differences between case and control groups in total narcotic use or achievement of mobility goals.

Discussion: We identified the need and acted to revise physician orders and educate staff to better reach this therapy's potential. Initially, nurses were more likely to administer narcotics than titrate the CFNBI. Based on the study results study, we increased the CFNBI drug concentration and expect this will allow us to meet all three patient goals.

Conclusion: CFNBI decreases the rated level of postoperative pain for patients undergoing TKA. With increase of the drug concentration we expect to replicate the findings of earlier studies regarding mobilization and decreased narcotic need. The structure of a research project facilitates the implementation, evaluation, and improvement of new therapies. Evaluating patient data allows identification of process improvement areas, in our case, the need for staff education and active participation in this new therapy as well as the change in drug concentration.

Implications for perianesthesia nurses and future research:
Education and active staff participation in the initiation of new therapies is essential to success. Nurse driven research provides tools to facilitate this success. Data collection also provides a large pool for further review. We plan to analyze links between BMI and: postoperative pain, narcotic use, mobilization, and length of stay.